



Dr. Tasnim Hassan, here with INL's Joel Simpson (left), is spending his four-month sabbatical at INL testing materials for heat exchangers in future high-temperature reactors.

## Dr. Hassan shares material expertise with INL

by Keith Arterburn, *INL Communications & Public Affairs*

It is a long trip from Bangladesh to Idaho Falls, especially when you travel via Arizona, Texas and North Carolina.

Dr. Tasnim Hassan, an associate professor from North Carolina State University (NCSU), is spending his four-month sabbatical at Idaho National Laboratory with materials experts in the Materials Science and Engineering Department. He is working with Richard Wright and a materials research team testing and modeling a material called "Alloy 617" to determine its suitability for use in the Next Generation Nuclear Plant (NGNP).

Hassan works closely with INL researchers Laura Carroll and Joel Simpson to collect data from material fatigue tests to see whether Alloy 617 could be used in a high-temperature reactor's heat exchanger. NCSU does not have high-temperature experimental capabilities, so the team is collecting data Hassan will use to create mathematical models of the material.

The very high temperature reactor planned for NGNP will require new materials that can operate at temperatures between 700-850oC. So, new materials must be tested, models must be created based on those results and an approved design code must be completed before building the first prototype.

"The constitutive modeling work he does will become increasingly important as we move to the engineering design of the NGNP," said Wright.

Hassan's INL sabbatical is his first experience with a U.S. Department of Energy national laboratory.

"The work ethic and environment at INL is wonderful," Hassan said. "When I need something, it is immediately done."

His face lights up when he talks about his work. "There are a lot of things we can work on together," referring to the materials research project for NGNP.

Hassan was born in Bangladesh, earned a bachelor's degree in civil engineering in 1981 and came to the U.S. for his graduate education. He earned his master's in engineering mechanics from the University of Arizona in 1985, then traveled on to the University of Texas in Austin where he completed his doctorate in the same subject in 1993. He liked America so much he decided to stay, becoming a citizen in 2000.

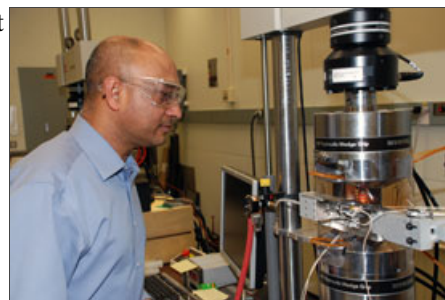
Hassan has two brothers living and working outside Bangladesh with one in California and the other in Toronto.

He began teaching at North Carolina State University in 1995. While working at the NCSU's Center for Nuclear Power Plant Structures, Equipment, and Piping, he became interested in nuclear power plant materials research. He was later able to visit the Harris commercial reactor in North Carolina and the North Anna Power Station in Virginia.

While attending the Nuclear Energy University Programs workshop in July 2008, Hassan met David Petti, an INL fellow and director of TRISO nuclear fuel research. Petti introduced Hassan to Wright and the collaboration on NGNP materials formed.

He also has hit the ski slopes with INL colleagues. "I like Idaho and the snowy winter, except when it is really wet," he said.

Hassan loves gardening and sees it as a way to stay fit. He also loves French food and describes his culinary capabilities, saying, "I am a cook, not a chef." When you add a dash of his favorite classical music and stir gently, you have an interesting colleague who is enjoying his time doing research here at INL.



***Hassan monitors a materials fatigue test in an INL Research Center laboratory.***

